

IN THE CLAIMS:

Amend the following claims:

Claim 1 (currently amended): A minute sample processing apparatus, comprising:

a focused ion beam optical system provided with an ion source, a lens for focusing an ion beam and an ion beam scanning deflector;

an electron beam optical system provided with an electron source, a lens for focusing an electron beam and an electron beam scanning deflector;

a detector for detecting a secondary particle discharged from a sample;

a sample stage on which said sample is placed;

a probe for supporting a minute sample which is cut out by applying the ion beam to said sample; and

a mechanism for ~~operating~~ rotating said probe so that a section of said cut-out minute sample becomes substantially perpendicular to an optical axis of said electron beam,

where said focused ion beam optical system and said electron beam optical system are arranged in a vacuum container.

Claim 2. (Cancelled).

Claim 3 (currently amended): A minute sample processing apparatus, comprising;

a focused ion beam optical system provided with an ion source, a lens for focusing an ion beam and an ion beam scanning deflector;

an electron beam optical system provided with an electron source, a lens for focusing an electron beam and an electron beam scanning deflector;

a detector for detecting a secondary particle discharged from a sample;

a sample stage on which said sample is placed;

a probe for supporting a minute sample which is cut out by applying the ion beam to said sample; and

a moving mechanism for moving said probe,

wherein said focused ion beam optical system and said electron beam optical system are arranged in a vacuum container,

wherein said moving mechanism has a function of adjusting a position ~~and an attitude~~ of the minute sample with respect to the ion beam or electron beam and a rotating mechanism to rotate said probe so that a section of the minute sample becomes perpendicular to an application direction of the ion beam or electron beam.

Claim 4 (currently amended): A minute sample processing apparatus comprising:

a focused ion beam optical system provided with an ion source, a lens for focusing an ion beam and an ion beam scanning deflector;

an electron beam optical system provided with an electron source, a lens for focusing an electron beam and an electron beam scanning deflector;

a detector for detecting a secondary particle discharged from a sample;

a sample stage on which said sample is placed;

a probe for supporting a minute sample which is cut out by applying the ion beam to said sample; and

a moving mechanism for moving said probe,

wherein said focused ion beam optical system and said electron beam optical system are arranged in a vacuum container,

wherein said moving mechanism comprises a function of controlling an application angle of the ion beam or electron beam to said minute sample so that a section of the minute sample becomes perpendicular to an application direction of the ion beam or electron beam.

Claim 5 (previously amended): The minute sample processing apparatus according to claim 3, further comprising a second sample stage on which a plurality of minute samples conveyed by said moving mechanism can be mounted, said second sample stage comprising a rotating mechanism for changing the application angle of the ion beam or electron beam to said plurality of minute samples.

Claim 6 (currently amended): A minute sample processing apparatus comprising:

a focused ion beam optical system provided with an ion source, a lens for focusing an ion beam and an ion beam scanning deflector;

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an electron beam optical system provided with an electron source, a lens for focusing an electron beam and an electron beam scanning deflector;
a detector for detecting a secondary particle discharged from a sample;
a sample stage on which said sample is placed;
a probe for supporting a minute sample which is cut out by applying the ion beam to said sample;
a moving mechanism for moving and rotating said probe so that a section of the minute sample becomes perpendicular to an application direction of the ion beam or electron beam; and
a detector for detecting an X-ray generated from said sample or minute sample resulting from application of the electron beam,
wherein said focused ion beam optical system and said electron beam optical system are arranged in a vacuum container.

Claim 7 (currently amended): A minute sample processing apparatus comprising:

a focused ion beam optical system provided with an ion source, a lens for focusing an ion beam and an ion beam scanning deflector;
an electron beam optical system provided with an electron source, a lens for focusing an electron beam and an electron beam scanning deflector;
a detector for detecting a secondary particle discharged from a sample;
a sample stage on which said sample is placed;
a probe for supporting a minute sample which is cut out by applying the ion beam to said sample;
a moving mechanism for moving and rotating said probe so that a section of the minute sample becomes perpendicular to an application direction of the ion beam or electron beam; and
a mechanism of changing an angle of said focused ion beam optical system,
wherein said focused ion beam optical system and said electron beam optical system are arranged in a vacuum container.

Claim 8 (currently amended): A minute sample processing method for observing a section of a sample using a minute sample processing apparatus which comprises a focused ion beam optical

system provided with an ion source, a lens for focusing an ion beam emitted from said ion source and a scanning deflector for scanning with the ion beam emitted from said ion source; an electron beam optical system provided with an electron source, a lens for focusing an electron beam emitted from said electron source and a scanning deflector for scanning with the electron beam emitted from said electron source; and a vacuum container in which said focused ion beam optical system and electron beam optical system are mounted,

wherein the method comprises the steps of:

cutting out a minute sample from said sample by applying a focused ion beam to said sample;

lifting said cut-out minute sample from said sample using a probe;

changing attitude of said minute sample by ~~operating~~ rotating said probe with a condition that said minute sample is being lifted so that a section of the minute sample becomes perpendicular to an application direction of the ion beam or electron beam; and

applying the electron beam to a section of said minute sample with a condition that said minute sample is supported by said probe and the attitude of said minute sample is changed, said steps being carried out in said vacuum container.

Claim 9 (original): The minute sample processing method according to claim 8, wherein said step of changing the attitude of said minute sample comprises controlling said probe so that the section of said minute sample becomes substantially perpendicular to an optical axis of the electron beam.

Claim 10 (original): The minute sample processing method according to claim 8, wherein a shape of said minute sample is tetrahedron or pentahedron.

Claim 11 (original): The minute sample processing method according to claim 8, wherein said sample is a semiconductor wafer with or without pattern.

Claim 12 (currently amended): A minute sample processing apparatus, comprising:
a vacuum container;

a charged particle source;

an application optical system for applying a charged particle beam from said charged particle source to the sample to separate part of a sample;

a secondary particle detector for detecting a secondary particle generated from the sample by application of the charged particle beam;

a sample stage for placing the sample in said vacuum container and for moving said sample in a direction perpendicular to an axis of said charged particle beam;

a needle member whose tip can be brought into contact with the ~~sample~~ separated sample part;

a probe holder for holding said needle member; and

an introduction mechanism capable of introducing and extracting said probe holder into and from said vacuum container, said introduction mechanism introducing said probe holder from a direction slanted with respect to the moving direction of said sample stage; and

a moving mechanism having a rotating mechanism to rotate said probe holder so that a section of the separated sample piece becomes perpendicular to an application direction of the charged particle beam.

Claim 13 (currently amended): A minute sample processing apparatus, comprising:

a vacuum container;

a sample stage for placing a sample in said vacuum container and for moving said sample in a direction perpendicular to an axis of a charged particle beam;

a first charged particle source;

a first application optical system for separating part of a sample on said sample stage with a charged particle beam from said first charged particle source;

a needle member for extracting the separated sample piece from the sample;

a probe holder for holding said needle member;

a second charged particle source;

a second application optical system for applying a charged particle beam from said second charged particle source to the separated sample piece attached to said probe holder or the sample on the sample stage;

secondary particle detecting means for detecting a secondary particle generated by application of said first or second charged particle beam;

a sample stage for placing a sample in said vacuum container and for moving said sample in a direction perpendicular to an axis of said charged particle beam;

a moving mechanism having a structure of moving said needle member in said vacuum container and ~~inclining~~ rotating said needle member ~~to a surface of said sample stage so that a section of the separated sample piece becomes perpendicular to an application direction of the charged particle beam;~~ and

introduction means for introducing and extracting said probe holder into and from said vacuum container, said introduction means introducing said probe holder from a direction slanted with respect to the moving direction of said sample stage.

Claim 14 (original): The minute sample processing apparatus according to claim 13, wherein said first charged particle source and said first application optical system, and second charged particle source and said second application optical system are relatively disposed in a slanting manner to a sample placing surface of said sample stage.

Claim 15 (currently amended): A minute sample processing apparatus, comprising:

a vacuum container;

a sample stage for placing a sample in said vacuum container and for moving a sample in a direction perpendicular to an axis of a charged particle beam;

a first charged particle source;

a first application optical system for separating part of a the sample on said sample stage with a charged particle beam from said first charged particle source;

a needle member for extracting the separated sample piece;

a first probe holder for holding said needle member;

a second probe holder for taking the extracted sample piece out of said vacuum container;

a second charged particle source;

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a second application optical system for applying a charged particle beam from said second charged particle source to the extracted sample piece attached to said first probe holder, the sample on said sample stage or a sample piece on said second probe holder;

secondary particle detecting means for detecting a secondary particle generated by application of said first or second charged particle beam;

~~a sample stage for placing a sample in said vacuum container and for moving said sample in a direction perpendicular to an axis of said charged particle beam;~~

a moving mechanism having a structure of moving said first and second probe holders in said vacuum container and ~~inclining~~ rotating said first and second probe holders ~~to a surface of said sample stage~~ so that a section of the extracted sample piece becomes perpendicular to an application direction of the first or second charged beam;

a first introduction part capable of introducing and extracting said first probe holder into and from said vacuum container, said introduction part introducing said first probe holder from a direction slanted with respect to the moving direction of said sample stage; and

a second introduction part capable of introducing and extracting said first probe holder into and from said vacuum container, said second introduction part introducing said first probe holder from a direction slanted with respect to the moving direction of said sample stage.

Claim 16. (Cancelled).